Development and Testing of the VAHIRR Radar Product

Joe Barrett III, Juli Miller, Debbie Charnasky and Robert Gillen ENSCO, Inc., Cocoa Beach, FL
Richard Lafosse, Brian Hoeth, Doris Hood NWS Spaceflight Meteorology Group, Houston, TX
Todd McNamara 45th Weather Squadron, Patrick AFB, FL

Lightning Launch Commit Criteria (LLCC) and Flight Rules (FR) are used for launches and landings at government and commercial spaceports. They are designed to avoid natural and triggered lightning strikes to space vehicles, which can endanger the vehicle, payload, and general public. The previous LLCC and FR were shown to be overly restrictive, potentially leading to costly launch delays and scrubs. A radar algorithm called Volume Averaged Height Integrated Radar Reflectivity (VAHIRR), along with new LLCC and FR for anvil clouds, were developed using data collected by the Airborne Field Mill II research program.

VAHIRR is calculated at every horizontal position in the coverage area of the radar and can be displayed similar to a two-dimensional derived reflectivity product, such as composite reflectivity or echo tops. It is the arithmetic product of two quantities not currently generated by the Weather Surveillance Radar 1988 Doppler (WSR-88D): a volume average of the reflectivity measured in dBZ and the average cloud thickness based on the average echo top height and base height.

This presentation will describe the VAHIRR algorithm, and then explain how the VAHIRR radar product was implemented and tested on a clone of the National Weather Service's (NWS) Open Radar Product Generator (ORPG-clone). The VAHIRR radar product was then incorporated into the Advanced Weather Interactive Processing System (AWIPS), to make it more convenient for weather forecasters to utilize. Finally, the reliability of the VAHIRR radar product was tested with real-time level II radar data from the WSR-88D NWS Melbourne radar.

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Joe H. Barrett III
Juli Miller, Debbie Charnasky, Robert Gillen
Richard Lafosse, Brian Hoeth, Doris Hood
Todd McNamara

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ENSCO, Inc.
1980 N. Atlantic Ave. Suite 230
Cocoa Beach, FL 32931

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